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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/497,743	02/04/2000	Jae-Yoel Kim	678-452(P9148)	7860

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EXAMINER

KUMAR, PANKAJ

ART UNIT	PAPER NUMBER
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2631

DATE MAILED: 12/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/497,743

Applicant(s)

KIM ET AL.

Examiner

Pankaj Kumar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/16/2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5 and 7-9 is/are rejected.
- 7) ☒ Claim(s) 3,6,10 and 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 10/14/2003 have been fully considered but they are not persuasive.
2. The preamble of claim 1 does merely cite the purpose of a process and the intended use of structures. Also, limitations, such as that of symbol, from the preamble are not required for completeness since they can stand alone. Therefore, all the applicant needs to do is to simply move the limitations of the preamble into the body of the claim in order for it to hold patentable weight.
3. The limitations of which symbols are transmitted from which antennas and that the antennas are transmitting the symbol simultaneously can stand alone and are not needed to apply a reasonably broad interpretation of the body of the claim. If the applicant wants a narrower interpretation of the claim, the limitations need to be in the body of the claim.
4. As per applicant's argument about first and second antennas in claim 1, again those limitations have not been claimed in the body of the claim.
5. Applicant argues with respect to claims 4 and 7 that elements 706 and 707 in fig. 10 are wires and not antennas. An antenna is a wire; therefore, elements 706 and 707 are antennas. An antenna is still an antenna irrespective of how it is transmitting and it is still an antenna even if it is not transmitting. Applicant's argument about wireless transmission is not claimed.

Response to Amendment

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 2, 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Durrant et al. 5,680,414.

8. As per claim 1, Durrant teaches a channel spreading method in a CDMA (Code Division Multiple Access) communication system which spreads a pair of symbols obtained by repeating a first symbol with a quasi-orthogonal code having a given length (inherent) to transmit the spread symbols through a first antenna and spreads a second symbol and an inverted symbol of said second symbol obtained by repeating said second symbol with said quasi-orthogonal code to transmit the spread symbols through a second antenna at the same time, the method comprising the steps of: spreading one of said pair of symbols (Durrant fig. 10: top cos w_1t , top sin w_1t) obtained by repeating said first symbol (Durrant fig. 10: top cos w_1t is a repetition of top sin w_1t but it is just phase shifted) with a portion of said quasi-orthogonal code (Durrant figs. 6, 10: top cos w_1t is spread with a portion of chips i.e. the odd portion) and spreading another symbol of said pair of symbols (Durrant fig. 10: top sin w_1t) with a remaining portion of said quasi-orthogonal code (Durrant figs 6, 10: top sin w_1t is spread with the remaining portion of the chips i.e. the even portion); and spreading the second symbol (Durrant fig. 10: bottom cos w_1t) with a portion of said quasi-orthogonal code (Durrant figs. 6, 10: bottom cos w_1t is spread with a

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portion of chips i.e. the odd portion) and spreading said inverted symbol of said second symbol (see rejection below) with the remaining portion of said quasi-orthogonal code (Durrant figs. 6, 10: bottom sin wlt is spread with a portion of chips i.e. the even portion)

9. Durrant does not teach an inverted symbol i.e. one that would be 180 degrees out of phase with $\cos wlt$. What Durrant teaches is since wlt which is 90 degrees out of phase with $\cos wlt$.

10. It is common knowledge to invert a symbol and it is common knowledge to choose an optimum value.

11. It would have been obvious to one skilled in the art at the time of the invention to modify Durrant to teach an inverted signal since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

12. As per claim 2, Durrant teaches the channel spreading method as claimed in claim 1, wherein the quasi orthogonal code spreading step comprises the step of mixing one symbol with a chip signal of a first half period of the quasi-orthogonal code (Durrant figs. 6, 10: mixing with even chips) and mixing another symbol with a chip signal of a second half period of the quasi-orthogonal code (Durrant figs. 6, 10: mixing with odd chips), so as to spread two symbols for duration of one quasi-orthogonal code (Durrant figs. 6, 10).

13. As per claim 4, Durrant teaches a channel spreading device in a CDMA communication system having first and second antennas to perform an orthogonal transmit diversity function,

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comprising: a first transmitter (Durrant fig. 10: transmission via 706) having a first spreader (Durrant fig. 10: 720, 730) for spreading a pair of symbols (Durrant fig. 10: $\cos w_1 t$, $\sin w_1 t$) obtained by repeating a first symbol (Durrant fig. 10: $\cos w_1 t$ is a repetition of $\sin w_1 t$ but it is just phase shifted) with a quasi-orthogonal code (Durrant figs. 6, 10: $\cos w_1 t$ is spread with a portion of chips i.e. the odd portion) having a given length (inherent) to transmit the spread symbols through a first antenna (Durrant fig. 10: the 706 connection can be considered an antenna), spreading one of said pair of symbols with a portion of said quasi-orthogonal code and spreading another symbol of said pair of symbols with a remaining portion of said quasi-orthogonal code (Durrant: discussed with respect to the discussion of claim 1); and a second transmitter (Durrant fig. 10: transmission via 707) having a second spreader (Durrant fig. 10: 740, 742) for spreading a second symbol and an inverted symbol of said second symbol obtained by repeating said second symbol with said quasi-orthogonal code to transmit the spread symbols through a second antenna (Durrant fig. 10: the 707 connection can be considered an antenna), spreading said second symbol with a portion of said quasi-orthogonal code and spreading said inverted symbol of said second symbol with the remaining portion of said quasi-orthogonal code (Durrant: remaining elements are similar to those discussed above).

14. As per claim 5, Durrant teaches the channel spreading device as claimed in claim 4, wherein each of the first and second spreaders mixes one symbol with a chip signal of a first half period of the quasi-orthogonal code and mixes another symbol with a chip signal of a second half period of the quasi-orthogonal code, so as to spread two symbols for duration of one quasi orthogonal code (Durrant: discussed with respect to the discussion of claim 2).

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15. Claims 7, 8, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Czaja USPN 6424631.

16. As per claim 7, Czaja teaches a channel spreading method in a CDMA (Code Division Multiple Access) communication system comprising the steps of: generating a first pair of symbols to duplicate (Czaja fig. 6B is duplication symbols of fig. 6A) an input (Czaja fig. 6A is what is eventually input into the transmitter for transmission); generating a second pair of symbols (Czaja fig. 6C: generates 4 replicas – 2 of which are the second pair since the first pair was in 6B) to create a complementary symbol of the input symbol (Czaja: any one of the 4 replicas in fig. 6C is a complement of the input fig. 6A); duplicating a first input symbol to create a first pair of symbols (Czaja fig. 6B-622 has S1 repeated); matching a second input symbol (Czaja fig. 6B-622 first S2) with its complement (Czaja fig. 6B-622 second S2) to create a second pair of symbols; spreading the first pair of symbols by a first quasi-orthogonal code in order to transmit the spread first pair of symbols through a first antenna; and spreading the second pair of symbols by a second quasi-orthogonal code in order to transmit the spread second pair of symbols through a second antenna (Czaja col. 1 paragraph 2 “In CDMA, each user signal includes a different orthogonal code ...” thus the first pair of symbols can be from one user and a second pair of symbols can be from another user)

17. Czaja fig. 7 shows 1 antenna.

18. Czaja does not show two antennas.

19. It is common knowledge to duplicate an antenna.

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20. It would have been obvious to one skilled in the art at the time of the invention to modify Czaja to have two antennas since it has been held that duplication of parts requires routine skill in the art.

21. As per claim 8, Czaja teaches the channel spreading method in claim 7 wherein the ~~first and second~~ quasi-orthogonal codes used to spread the first and second pair of symbols are the same (Czaja: since in a CDMA system, there will be multiple users each with a different code, if both the first and second symbol belong to the same user, they will be spread with the same code).

22. As per claim 9, Czaja teaches the channel spreading method in claim 7 wherein the ~~first and second~~ quasi-orthogonal codes used to spread the first and second pair of symbols are different (Czaja: since in a CDMA system, there will be multiple users each with a different code, if both the first symbol belongs to a different user than the second symbol, then the two symbols will be spread with different codes).

Allowable Subject Matter

23. Claims 3, 6, 10 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The art of record does not suggest the respective claim combinations together and nor would the respective claim combinations be obvious with the following:

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24. For claims 3, 6: generating a mask index and a Walsh code index corresponding to an input index for generating the quasi-orthogonal code

25. For claim 10: one of the first pair of symbols is spread by a portion of the quasi-orthogonal code and other of the first pair of symbols is spread by the remaining portion of the quasi-orthogonal code.

26. For claim 11: one of the second pair of symbols is spread by a portion of the quasi-orthogonal code and other of the second pair of symbols is spread by the remaining portion of the quasi-orthogonal code.

Conclusion

27. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

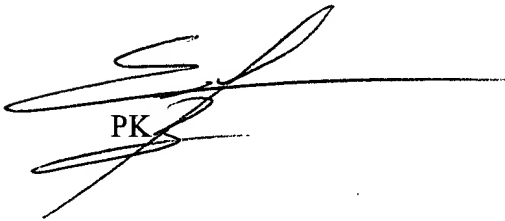
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pankaj Kumar whose telephone number is (703) 305-0194. The examiner can normally be reached on Mon, Tues, Wed and Thurs after 8AM to after 6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (703) 306-3034. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.



PK